Name: Date:

Polynomial Factoring solution (version 690)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 13 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 52}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-48}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{2 \pm 4\sqrt{3}\,i}{2}$$

$$x = 1 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 - 4i$ and $-8 + 2i$ in standard form $(a + bi)$.**

Solution

$$(3 - 4i) \cdot (-8 + 2i)$$

$$-24 + 6i + 32i - 8i^2$$

$$-24 + 6i + 32i + 8$$

$$-24 + 8 + 6i + 32i$$

$$-16 + 38i$$

Polynomial Factoring solution (version 690)

3. **Write function $f(x) = x^3 + 15x^2 + 74x + 120$ in factored form. I'll give you a hint: one factor is $(x + 5)$.**

Solution

	1	15	74	120
-5		-5	-50	-120
	1	10	24	0

$$f(x) = (x + 5)(x^2 + 10x + 24)$$

$$f(x) = (x + 5)(x + 4)(x + 6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 8)^2 \cdot (x + 5) \cdot (x + 1)^2 \cdot (x - 4)^2$$

Sketch a graph of polynomial $y = p(x)$.